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## SECTION V - CHANGING THE WAY WE FIGHT

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The Department is increasing investment accounts and will continue to acquire transformational capabilities. Our future Navy will consist of ships with more speed, persistence, precision, and reach. The FY 2007 shipbuilding program embodies this transformation. From platforms now beginning delivery to those beginning design and construction, like DD(X), every ship is designed for 21<sup>st</sup> century Naval operations. Similarly, we are producing seven new design aircraft. The aircraft procurement plan emphasizes replacing legacy platforms that are becoming increasingly costly to operate with more efficient and capable integrated systems. This is a sweeping shift to newer, more capable platforms, outfitted with more capable systems.

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### SHIP PROGRAMS

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#### *Surface Programs*

The Department's FY 2007 budget continues to address acquisition, modernization, and recapitalization of the world's preeminent surface fleet. Continuing to integrate emerging technologies, the Navy will ensure that tomorrow's fleet will remain on the cutting edge. FY 2007 will continue the shift to next generation warships.

CVN-21 will be the future centerpiece of the carrier strike group. It will have a new electrical generation and distribution system, an electromagnetic aircraft launching system, a new/enlarged flight deck, weapons, and material handling improvements, and a smaller crew and air wing (by at least 1000). The budget continues advance procurement funding for construction of CVN-21, which starts in FY 2008.

DD(X) will play a key role in the *Sea Power 21* strategic concept. Winning the fight requires the ability to assure access and enable maneuver warfare. DD(X) will be a multi-mission surface combatant and will be the precision strike and volume fires provider within the family of surface combatants. It will provide credible forward presence while operating independently or as an integral part of naval, joint, or combined expeditionary forces. Armed with an array of land attack weapons, DD(X) will provide



offensive, distributed, and precision firepower at long ranges in support of forces ashore. The FY 2007 budget provides the first of two increments of funding to support dual lead ship detail design and construction contract awards in FY 2007.

Another critical component of *Sea Power 21* is the Littoral Combat Ship (LCS). LCS will be a fast, agile, stealthy, relatively small, and affordable surface combatant

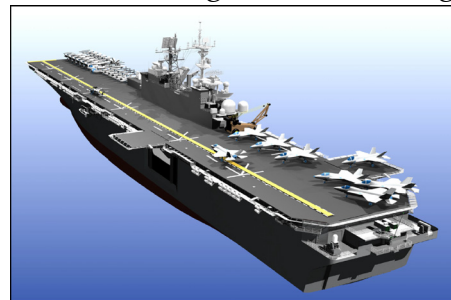


capable of operating against anti-access, asymmetric threats in the littorals. The primary mission areas of LCS are small boat prosecution, mine counter measures, shallow water anti-submarine warfare, intelligence, surveillance, and reconnaissance. Secondary missions include homeland defense, maritime intercept, and special

operations forces support. It will operate in environments where it is impractical to employ larger multi-mission ships. Construction of both LCS flight 0 designs is in progress. Congress added two LCS ships in FY 2006 and the Department budgeted for two more LCS in FY 2007. Procurement of two mission packages is also planned in FY 2007.

The restructured Guided Missile Cruiser (CG-47) modernization program supports modernization of the older Baseline 2 and 3 ships first. Funding continues in FY 2007 for long lead-time procurements for the Baseline 2 modernization availabilities in FY 2008 and 2009.

The FY 2007 budget provides the first of two increments of funding for the Landing Helicopter Assault Replacement Ship (LHA(R)). Flight 0 will be procured in FY 2007, and additional funding is planned for RD TEN efforts in support of a LHA(R) Flight 1 procurement in FY 2010.



The budget provides for procurement of one Auxiliary Cargo and Ammunition Ship (T-AKE) in the National Defense Sealift Fund (NDSF). This will be the tenth ship of the class. The NDSF budget also includes funding for the development of future seabasing ships, and for the purchase of one Maritime Prepositioning Ship, which is currently under charter, and continues development of future seabasing ships. The Maritime Prepositioning Force (Future) (MPF(F)) squadron of ships, a central part of the Sea Base operational concept, leverages current designs and production lines where possible, such as T-AKE variant ships, modified Large, Medium Speed Roll-On/Roll-Off (LMSR) ships and LHA(R) ships. MPF(F) new construction commences in FY

2009 and includes one T-AKE variant and one Mobile Landing Platform (MLP). MPF(F) ships will be interoperable with current and planned Landing Craft Air Cushion (LCAC) craft and Joint High Speed Vessels (inratheater connectors).

The LCAC modernization program continues with a service life extension for six craft in FY 2007. The budget request includes RDTEN funding in FY 2007 for transformational Sea Base to Shore and Intratheater connectors to support Seabasing.

The FY 2007 budget also provides the second increment of funding for the CVN 70 Refueling Complex Overhaul.

Chart 15 displays shipbuilding quantities for FY 2006 to FY 2011.

**Chart 15 - Shipbuilding Programs**

	<u>FY06</u>	<u>FY07</u>	<u>FY08</u>	<u>FY09</u>	<u>FY10</u>	<u>FY11</u>	<u>FY07-11</u>
CVN 21	-	-	1	-	-	-	1
SSN 774	1	1	1	1	1	1	5
DD(X)	-	2	-	1	1	1	5
CG(X)	-	-	-	-	-	1	1
LCS	3	2	3	6	6	6	23
LPD 17	1	-	1	-	-	-	1
LHA(R)	-	1	-	-	1	-	2
T-AKE	1	1	1	1	1	1	5
MPF Aviation	-	-	-	-	-	1	1
MPF LMSR	-	-	-	-	1	1	2
MPF MLP	-	-	-	1	-	1	2
Intratheater Connectors	-	-	-	1	1	1	3
<b>New Construction</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>11</b>	<b>12</b>	<b>14</b>	<b>51</b>
Sea-Shore Connectors	-	-	-	-	1	4	5
SSBN ERO	1	1	1	1	1	1	5
SSN ERO	-	-	1	-	-	-	1
RCOH	1	-	-	-	1	-	1

### **Submarine Programs**

The Navy will continue to project power covertly with a fleet of modern SSN-688, SSGN, *Seawolf*, *Virginia* class, and *Trident* submarines. Their firepower, stealth, sensors, and communications equipment will enable submarines to act as force multipliers. This budget includes the continuing effort to modernize the submarine fleet with the latest technology ensuring the viability of these critical ships while, at the same time, continuing to replace aging fast attack submarines with the new *Virginia* class. Construction of *Virginia* class submarines is performed under a



teaming arrangement with General Dynamics and Northrop Grumman Newport News Shipbuilding Company. FY 2007 funds the fourth of five submarines under a multi-year procurement contract awarded in January 2004. The FY 2007 budget also provides funds for one SSBN Engineered Refueling Overhaul.

### *Ship Weapons Programs*

The Standard Missile program replaces ineffective, obsolete inventories with the more capable Block IIIB missiles. The Rolling Airframe Missile (RAM) program continues procurement of the improved Guided Missile Launching System and the upgraded Block I missile, providing an enhanced guidance capability along with a helicopter, air, and surface mode. In addition to Standard Missile and RAM, the FY 2007 budget provides funding to continue production of the Evolved Sea Sparrow Missile (ESSM). Additionally, the Tactical Tomahawk missile continues full rate production in FY 2007 via multi-year procurement.



Major Weapons Quantities							
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Tactical Tomahawk	298	408	350	421	366	377	363
Standard Missile	75	75	75	75	90	100	105
RAM	86	90	90	90	90	90	90
ESSM	71	116	108	108	108	21	-

Several land attack research and development efforts critical to future littoral warfare continue in FY 2007, including an extended range munition, the 5"/62 gun, the Advanced Gun System (AGS), the Naval Fires Control System (NFCS), and the Distributed Common Ground System (DCGS). The AGS will provide the next generation of surface combatants with a modular large caliber gun system including an automated magazine handling system. The NFCS and DCGS will use existing fire control infrastructure to serve as the nerve center for surface land attack by automating shipboard land attack battle management duties, incorporating improved land attack weapons systems, and utilizing battlefield digitization.



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## AVIATION PROGRAMS

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### *Aircraft Programs*

The Department's FY 2007 budget sustains aviation superiority for the Navy and Marine Corps and emphasizes capability based investment strategies, new warfighting concepts, and enabling technologies.



The budget continues to maximize the return on procurement dollars, primarily through the use of multi-year procurement contracts for the F/A-18E/F and EA-18G (both airframe and engine), E-2C, UH-60M/MH-60R/MH-60S airframe (with the Army), MH-60 R/S common cockpit, MH-60R

mission system and USMC KC-130J. The Department continues to implement the Tactical Air integration plan to reduce the number of new aircraft needed. Robust development funding is also provided for Joint Strike Fighter (JSF), MV-22, EA-18G, Multi-Mission Maritime Aircraft (MMA), Advanced Hawkeye, CH-53X (Marine Corps heavy lift replacement), and Executive Transport Helicopter (VXX).

The F/A-18E/F continues to be the centerpiece of Navy combat aviation. Enhanced warfighting capability investments for the F/A-18E/F introduce a transformational radar, helmet-mounted sight, advanced targeting pod, and fully integrated weapons system. The FY 2007 budget includes funding for 12 EA-18Gs, the follow-on to the EA-6B Electronic Attack aircraft.

The Department will continue to procure AH-1Z/UH-1Y attack and utility helicopters. These aircraft will provide numerous capability improvements for the Marine Corps, including increased payload, range, and time on station, improved sensors and lethality, and 84 percent component commonality. Both aircraft will also incorporate common, modernized, and fully integrated cockpits/avionics that will reduce operator workload, and improve situational awareness and safety.



The MH-60R and MH-60S multi-mission helicopters are the cornerstone of the Navy helicopter concept of operations and provide a continuous shield of protection for carrier strike groups and expeditionary strike groups. The MH-60S Armed Helicopter Enhancement, including Hellfire missiles, assures forward deployed force protection and small-boat/terrorist engagement capability.

The Department continues to support the legacy P-3 fleet and develop the MMA to ensure current and future maritime patrol capabilities are met. The Department continues to fund the Special Structural Inspection Kit program, which provides pre-emptive replacement of P-3 wing components and extends aircraft service life a minimum of 5,000 flight hours. Additionally, FY 2007 RDT&E,N funding for MMA will help ensure the Initial Operating Capability of FY 2013 will be met.



The Aerial Common Sensor (ACS), the EP-3E replacement capability, was a joint development program with the Army to provide a transformational multi-intelligence platform. Due to developmental delays, the Army's ACS contract was terminated in December 2005. The FY 2007 budget will focus instead on sustainment of the EP-3E until alternatives are developed and fielded.

Joint aircraft programs continue to be an important component of the naval acquisition strategy, with the JSF continuing in the Systems Development and Demonstration phase. The Department resumes full-scale procurement of the Joint Primary Aircraft Training System (JPATS), a joint Navy-Air Force program, in FY 2007. This follows a "strategic pause" from FY 2002 to FY 2006, which allowed the Navy to optimize remaining service life on T-34C aircraft and fund more urgent competing requirements. The T-6A Texan II is the aircraft designed to replace the



Navy T-34 and Air Force T-37 fleet currently being used as the primary flight trainer for entry-level Naval and Air Force student pilots. The joint V-22 program continues with the procurement of both the MV and CV models. The V-22 program is designed to meet the amphibious/vertical assault needs of the Marine Corps and the fleet logistics, special warfare and strike rescue needs of the Navy, and to supplement United States Special Operations Command special mission aircraft.

Continuing the emphasis on transformational systems, the Department has budgeted research and development funding for several aviation programs. The Advanced Hawkeye is funded through the FYDP with the first production in FY 2008. A fully automated digital engine control and improved generators have been incorporated to improve performance and reliability. Additionally, the Department has included funding to support procurement of required capabilities in the fleet, such as Advanced Targeting Forward Looking Infra-Red, Joint Helmet Mounted

Cueing Systems, and Tactical Aircraft Directed Infrared Countermeasure systems (TADIRCM), which the Department is developing with the Army. TADIRCM will be used on fixed and rotary wing aircraft to defeat air-to-air, surface-to-air, and Man Portable Air Defense missiles. The development of the VXX, the replacement for the legacy Presidential helicopter fleet, and the CH-53X, the Marine Corps heavy lift replacement, continues in FY 2007.



The FY 2007 budget continues to demonstrate the Department's commitment to developing, acquiring, and fielding transformational Unmanned Aerial Vehicle (UAV) technologies for intelligence, surveillance, reconnaissance, and tactical missions. The budget includes funding for the Broad Area Maritime Surveillance (BAMS) UAV and a Vertical Take Off and Landing UAV (VTUAV) for deployment on LCS ships.

Chart 16 displays the Department's new production and remanufactured aircraft programs for FY 2006 - FY 2011.

**Chart 16 - Aircraft Programs**

	FY06	FY07	FY08	FY09	FY10	FY11	FY07-11
JSF	-	-	8	32	36	33	109
F/A-18E/F	38	30	24	20	22	14	110
EA-18G	4	12	18	22	20	10	82
MV-22	9	14	19	31	35	37	136
AH-1Z/UH-1Y	10	18	19	23	23	23	106
MH-60S	26	18	20	26	26	26	116
MH-60R	12	25	25	31	32	31	144
E-2C	2	2	-	-	-	-	2
E-2D	-	-	4	4	4	4	16
CH-53X	-	-	-	-	2	2	4
MMA	-	-	4	-	6	8	18
C-40	-	-	-	5	1	1	7
C-37	-	-	-	-	-	1	1
T-45	6	12	-	-	-	-	12
JPATS	3	21	48	48	48	48	213
KC-130J	5	4	4	-	-	-	8
V-XX	5	-	3	4	3	4	14
BAMS UAV	-	-	-	-	-	4	4
VTUAV	5	4	7	11	11	10	43
F-5E	9	5	-	-	-	-	5
<b>TOTAL</b>	<b>134</b>	<b>165</b>	<b>203</b>	<b>257</b>	<b>269</b>	<b>256</b>	<b>1,150</b>
<i>Funded in RDTEN</i>							

Within our aircraft modifications program, we continue emphasis on safety as well as key operational improvements. The FY 2007 budget includes funding for procurement of the AV-8B Open System Core Avionics Requirements program to update obsolete avionics, the F/A-18 Radar Upgrade, and various structural and safety improvements. Funding is provided for H-53 engine and aircraft sustainment to ensure the H-53 fleet will continue to meet operational requirements until the CH-53X replaces the legacy fleet. Funding is also provided for the P-3/EP-3 Update III Common Configuration program, and upgrades to tactical aircraft electronic warfare countermeasures capabilities.

## Aircraft Weapons Programs

The employment of precision-guided munitions during Operation Enduring Freedom and Operation Iraqi Freedom demonstrated all weather, day and night, precision strike delivered well inland on demand. The FY 2007 budget continues to procure the M82 variant of the Joint Direct Attack Munition (JDAM) and includes procurement of unguided bombs to support deliveries of JDAM and Laser Guided Bomb precision guidance kits. The FY 2007 budget also focuses on production of the Joint Standoff Weapon (JSOW) breaching variant.



Major Aviation Weapons Quantities							
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
JSOW	405	420	397	421	504	521	546
AIM-9X	135	159	174	107	120	114	122
JDAM	6,930	3,400	3,400	1,500	1,500	1,500	1,500
AMRAAM	37	85	150	140	150	150	150

The AIM-9X (Sidewinder) missile continues to provide short-range air-to-air superiority. The Department continues the procurement of the Advanced Medium Range Air-to-Air Missile (AMRAAM), the next generation, all weather, all environment, radar guided missile for air defense.

**Also refer to Appendix A for more information:**

Aircraft Procurement, Navy  
 Weapons Procurement, Navy  
 Procurement of Ammunition, Navy and Marine Corps  
 Research, Development, Test and Evaluation, Navy

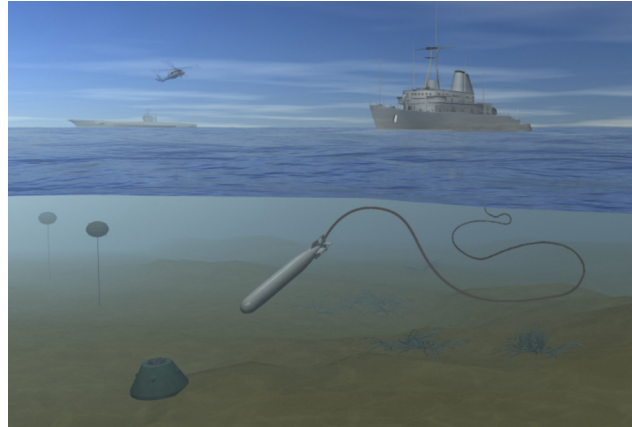
**Table**

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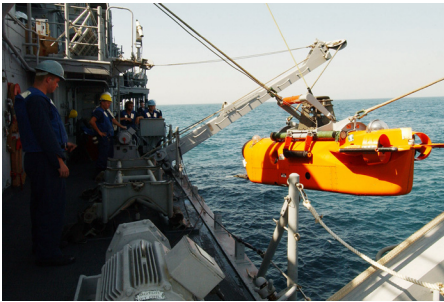


## MINE WARFARE

The FY 2007 budget includes funding for an organic mine warfare capability while maintaining a potent and dedicated Mine Countermeasure force. The FY 2007 budget continues the development and integration of the Airborne Mine Countermeasures (MCM) systems. The AMCM program includes the Airborne Laser Mine Detection System (ALMDS, IOC of FY 2008), Organic Airborne and Surface Influence Sweep system (OASIS, IOC of FY 2009), Airborne Mine Neutralization System (AMNS, IOC of FY 2009), and Rapid Airborne Mine Clearance System (RAMICS, IOC of FY 2010). Funding is also included for development of a single common console for all AMCM systems to establish a fully integrated mid-term organic mine warfare capability on the MH-60S helicopter. These key organic systems will make up the mine warfare mission modules slated for use on the LCS.



The FY 2007 budget continues to support the Assault Breaching System, a family of systems in development to counter the mine and obstacle threat in the beach and surf zones. As a part of this family of systems, the Coastal Battlefield Reconnaissance and Analysis (COBRA) system, a UAV and payload ground processing station, will conduct tactical reconnaissance using multi-spectral imaging for detection of mine fields, obstacles, and camouflaged defenses in the surf zone and inland.



**Also refer to Appendix A for more information:**

Weapons Procurement, Navy  
Other Procurement, Navy  
Research, Development, Test and Evaluation, Navy

**Table**

A-11  
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## C4I PROGRAMS

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The Navy's Command, Control, Communication, Computers, and Intelligence (C4I) programs represent the backbone of the combat capability of naval forces. The C4I evolutionary plan revolves around four key elements: connectivity; a common tactical picture; a "Sensor-to-Shooter" emphasis; and information/command and control warfare. Central to this is the continued development of FORCEnet in the FY 2007 budget. FORCEnet is the cornerstone architecture that will integrate sensors, networks, decision aids, and weapons into an adaptive human control maritime system in order to achieve dominance across all warfare spectrums.

A central theme continuing to shape the Navy's budget for C4I programs is the concept of Information Technology for the 21st Century (IT-21). IT-21 provides the common backbone for C4I systems to be linked afloat and to the Internet. The



networks integrate afloat tactical operations and tactical support applications with enhanced satellite systems and ashore networks. FY 2007 funding continues to provide Integrated Shipboard Network Systems (Increment 1) procurement and installation to achieve a Full Operational Capability (FOC) for all platforms by FY 2011. IT-21 connectivity is critical because it provides the managed bandwidth for timely transmission of information. The Satellite Communications Systems program continues expansion of available bandwidth to the warfighter.

FY 2007 funding reflects the continued development and procurement of the Advanced Narrowband System/Mobile User Objective Systems (ANS/MUOS), leading to an Initial Operational Capability (IOC) in FY 2010 and FOC in FY 2014. ANS/MUOS will provide the DoD's Ultra High Frequency satellite communication capability for the 21<sup>st</sup> century.

FY 2007 funding will continue the development of Advanced Extremely High Frequency terminals that support Air Force's Advanced Wideband System satellite program to meet an IOC in FY 2012 and FOC in FY 2015.

Funding in FY 2007 also continues the procurement and installation of 525 kilohertz UHF modems, Super High Frequency terminals, and provides for upgraded power distribution and enhanced connectivity "drops" accomplished during equipment installations.

The “Sensor-to-Shooter” concept, which is increasingly critical in the Joint arena, focuses on the process of putting a weapon on target using all available sensor data. Funding continues in FY 2007 for the Advanced Tactical Data Links system, ensuring timely transmission of surveillance, targeting, engagement, combat identification, and battle damage assessment information over IT-21 networks.

Information Warfare/Command and Control Warfare is the integrated use of operations security, military deception, psychological operations, electronic warfare, and physical destruction to deny information to, influence, degrade, or destroy an adversary’s C2 capabilities against such actions. FY 2007 funding provides for the procurement of Common Data Link - Navy systems and continues funding for the Maritime Cryptologic Systems for the 21<sup>st</sup> Century. In the Information Systems Security Program, FY 2007 funds the procurement of Mission Critical Secure Voice (SV-21) Interworking Function and SV-21 crypto to support the Gateway transfer for SATCOM transmission. FY 2007 funding also continues to provide cryptologic equipment and secure communications equipment for Navy ships, shore sites, aircraft, Marine Corps and Coast Guard.

**Also refer to Appendix A for more information:**

Other Procurement, Navy  
Procurement, Marine Corps

**Table**

A-13  
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## ***MARINE CORPS GROUND EQUIPMENT***

This category of our budget supports the development and fielding of all equipment used by Marine Corps ground forces. These programs modernize existing capabilities; some will help provide truly transformational methods that the Marine Corps will bring to future conflicts.

Modernization efforts contained within the FY 2007 budget reflect several major replacement and upgrade programs, both new and continuing. Included are the High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) and the Light Armored Vehicle Product Improvement Program (LAV PIP). The LAV PIP ensures that LAV combat capabilities will be preserved through FY 2015.



This budget includes initial procurement of the transformational Expeditionary Fighting Vehicle (EFV), the successor to the current amphibious vehicle, the Assault Amphibious Vehicle Model 7A1. The EFV will allow immediate high-speed surface maneuver by Marine infantry units as they are off-loaded by ships located beyond the enemy's visual horizon. Low-Rate Initial Production begins in FY 2007 and will start delivery in FY 2008. Initial Operational Capability will be reached in FY 2010 and Full Operational Capability in 2020.



Critical to Marine Corps transformation efforts, the Lightweight 155mm Howitzer (LW-155) will provide significant improvements over the current M198 system. Its lighter weight and increased lethality will allow for rapid deployment and improved accuracy. The LW-155 is compatible with all U.S. and NATO 155mm rounds, and its smaller footprint reduces the strategic sealift required. The FY 2007 budget continues procurement of the LW-155 on a multiyear procurement contract jointly with the Army.

Another transformational program, the High Mobility Artillery Rocket System (HIMARS), is also a joint Army-Marine Corps program. HIMARS is a C-130 transportable, wheeled, indirect fire weapon system with a range of 30 to 60 km, thus providing a major improvement in area fire support. Launcher production is complete in FY 2007.

Procurement of Assault Breaching Vehicles (ABVs) is completed in FY 2006, with procurement of ancillary equipment continuing in FY 2007. The ABV provides the ability to breach minefields and clear complex obstacles while keeping pace with the maneuver force and providing exceptional crew protection and survivability. Additionally, the ABV uses a rebuilt and upgraded M1 tank chassis, affording the economic advantages of commonality with the M1A1 tank fleet.

Major Marine Corps Ground Equipment Procurement Quantities							
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
HMMWV	3,611	2,763	851	596	1,211	1,143	1,095
EFV	-	-	15	17	26	42	100
LW155	106	75	34	47	-	-	-
HIMARS	1	18	6	-	-	-	-
ABV	4	18	-	-	-	-	-

**Also refer to Appendix A for more information:**

Procurement, Marine Corps  
 Procurement of Ammunition, Navy and Marine Corps  
 Research, Development, Test and Evaluation, Navy

**Table**

A-14  
 A-15  
 A-16



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## RESEARCH AND DEVELOPMENT SUPPORT

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### *Processes for Innovation*

Sea Trial is the Navy process of integrating emergent concepts and technologies, leading to continuous improvements in warfighting effectiveness and a sustained commitment to innovation. It is based on the mutually reinforcing mechanisms of technology push, concept pull, and spiral development. It puts the Fleet at the heart of innovation and provides a mechanism to more readily capture the fruits of their operational excellence and experimentation.

Led by the Naval Warfare Development Command (NWDC), Sea Trial is designed to constantly survey the changing frontier of technological development, identifying those candidates with the greatest potential to provide dramatic increases in warfighting capability. The result is a process that discovers and aligns emergent technologies to deliver next-generation equipment. Following the warfighters' lead, supporting centers for concept development propose innovative operational concepts to address emergent conditions. A basic premise is that new capabilities must be delivered to the Fleet quickly and efficiently. To retain technological superiority, we are shifting to spiral development. Under the spiral development philosophy, systems are designed to receive technological updates at regular intervals without disrupting production or performance. A primary goal of Sea Trial is to more fully integrate the technological and conceptual centers of excellence in the Systems Commands and elsewhere, along with testing and evaluation centers, so that their combined efforts result in significant advancements in deployed combat capability. Working closely with the Fleet, technology development centers, Systems Commands, warfare centers, and academic resources, NWDC will continue to align wargaming, experimentation, and exercise events so that they optimally support the development of transformational concepts and technologies.



The FY 2007 budget continues to finance Marine Corps led experimentation with future tactics, concepts, and innovations involving both Marine and Navy forces. The Marine Corps Warfighting Laboratory is the centerpiece for operational reform in the Marine Corps, investigating new and potentially valuable technologies, and evaluating their impact on how the Marine Corps organizes, equips, and trains to fight in the future. Examples of such efforts include work on command post

systems, command and control shared data environments, landing force technologies, defeat of improvised explosive devices, and assault vehicles. In addition, the budget continues to finance Non-Lethal Weapons research and development - a program for which the Marine Corps serves as the executive agent. In the FY 2007 budget, we seek to leverage developing and emerging technologies that have applications across the spectrum of warfare, giving the Marine Corps the versatility to tackle any mission it may confront in an ever-changing world environment.

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### *Science and Technology*

Technology will never substitute for presence; rather it should always address a mission requirement of making Naval Forces more effective. The fiscal year 2007 Budget requests \$1.6 billion for a Science & Technology (S&T) portfolio designed to provide the best scientific research and technology in the shortest time to maximize the benefit to our Sailors and Marines.

The Department pursues an integrated and comprehensive S&T program, from basic research through manufacturing technology. Programs emphasize integrating basic research with applied science and technology, promoting the effective and expeditious transition of discovery and invention into real-world applications. Moreover, “transition” has become of utmost importance, as the success of S&T is not measured simply by the basic science it supports, but also by the active and successful transition of that science to supporting America’s Sailors and Marines in the field: discovery and invention as well as exploitation and deployment of advanced technologies for the nation’s Naval warfighters.

At the basic research end of the spectrum, investigations are focused on scientific and technical disciplines—ocean sciences, materials, electronics, mathematics, physics, chemistry, medicine, and others—and on discovering and understanding new phenomena that hold promise for future application in the Navy and Marine Corps-after-Next. Special emphasis is placed on those technologies that are uniquely naval and maritime and usually of interest primarily to the sea services, or those that leverage applicable naval disciplines in conjunction with the rest of America’s basic research establishment. The Department recognizes and meets its obligation to support and maintain coordinated national programs in these areas of such vital importance to the Naval services.

Efforts on behalf of Tomorrow’s Fleet/Force—largely technology development—are organized in terms of a series of Future Naval Capabilities (FNCs) that focus on

major technical barriers challenging the Navy and Marine Corps in transforming themselves for 21st-Century operations. Components and systems developed to solve the operational problems defined by the FNCs are evaluated in feasibility demonstrations, prototypes, and field trials, with the results made available to Navy system developers. FNCs are fully integrated with Navy and Marine warfighting requirements and budget-development processes.

The Fiscal Year 2007 Budget request continues funding to develop several innovative Naval prototypes. These initiatives include an electro-magnetic railgun prototype; new concepts for persistent, netted, littoral anti-submarine warfare; technologies to enable Sea-basing; and the Naval tactical utilization of space. innovative Naval prototypes represent revolutionary “game changers” for future naval warfare.

A key S&T goal in addressing the Improvised Explosive Device (IED) threat is to understand the basic phenomenology involved in the ability to detect, defeat, and destroy IEDs at range and speed. Long-term basic and applied research will be conducted to address the foundations of current and future IED threats. Sensor, chemistry, physics, material, and electronic warfare expertise must be exploited by taking a scientific systems approach to attacking each step in the engagement sequence. Most importantly, this long-term initiative will explore fundamental scientific phenomena, creating a community of scholars across the human/behavior/social sciences with the physical science and technology, to render IEDs ineffective or unviable weapons of choice.

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### *Management and Support*

Research, Development, Test, and Evaluation Management Support funds installations and efforts required for general research and development use. This includes operation of the Navy’s test range sites and facilities; dedicated research and development aircraft and ship operations; and target and threat simulator development efforts. The funding level reflects required infrastructure support commensurate with overall Navy force structure and facilities management consolidations. Sixty-eight percent of this funding, or about \$520 million in FY 2007, supports the Major Range and Test Facilities Base, necessary to conduct independent test and evaluation assessments for all Navy ship, submarine, aircraft, weapons, combat systems, and other development, acquisition, and operational system improvements.

The remaining categories of research are platform-related and have been discussed as applicable in the previous sections. Table 19 provides Research, Development, Test and Evaluation, Navy summary data at the budget activity level and highlights major systems efforts.

**Table 19****Department of the Navy****Research, Development, Test and Evaluation***(In Millions of Dollars)*

	FY 2005		FY 2006		FY 2007	
	\$	% of S&T	\$	% of S&T	\$	% of S&T
<b><u>Significant RDT&amp;E,N Activities</u></b>						
Science and Technology	2,289	100%	2,296	100%	1,599	100%
<i>Basic Research</i>	478	21%	475	21%	456	28%
<i>Applied Research</i>	802	35%	799	35%	639	40%
<i>Advanced Technology Development</i>	1,009	44%	1,022	44%	504	32%
Advanced Component Development	3,091		3,487		2,909	
System Development and Demonstration	7,418		8,829		7,915	
RDT&E Management Support	998		778		765	
Operational Systems Development	3,281		3,343		3,723	
<b>Total RDT&amp;E,N</b>	<b>\$17,077</b>		<b>\$18,733</b>		<b>\$16,911</b>	
<b>NDSF R&amp;D</b>	<b>52</b>		<b>72</b>		<b>109</b>	
<b>Total R&amp;D</b>	<b>\$17,129</b>		<b>\$18,805</b>		<b>\$17,020</b>	
<b><u>Major Systems Efforts:</u></b>						
Joint Strike Fighter	2,084		2,269		2,031	
MMA	471		950		1,132	
C4I	773		1,075		1,005	
DD(X)	1,120		1,068		794	
VXX	536		922		683	
Advanced Hawkeye	542		614		498	
EA-18G	347		394		372	
CH-53X	99		268		363	
Littoral Combat Ship (LCS)	451		574		320	
CVN-21	350		303		309	
V-22	248		203		268	
Unmanned Combat Aerial Vehicle (UCAV)	-		-		239	
Expeditionary Fighting Vehicle (EFV)	239		250		188	
Virginia Class SSN	157		176		170	
Unmanned Aerial Vehicles (UAV)	141		115		142	
MPF Family	28		58		86	

Note: Totals may not add due to rounding.

**Also refer to Appendix A for more information:**  
 Research, Development, Test and Evaluation, Navy  
 National Defense Sealift Fund

**Table**  
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 A-17